

What is claimed is:

Claim 1. A resin composition comprising:

a matrix polymer; and

a combination of:

a fluoropolymer at least partially encapsulated by an encapsulating polymer; and

a filler.

Claim 2. The composition of claim 1 wherein said composition has an improved tensile modulus and / or elongation at break relative to a composition comprising matrix polymer and only component (1) or (2) of the combination.

Claim 3. The composition according to claim 1, wherein said matrix polymer is at least one selected from the group consisting of polyvinyl chloride, polyolefins, polyesters, polyamides, polysulfones, polyimides, polyetherimides, polyether sulfones, polyphenylene sulfides, polyether ketones, polyether ether ketones, ABS resins, polystyrenes, polybutadiene, polyacrylates, polyaklylacrylates, polyacrylonitrile, polyacetals, polycarbonates, polyphenylene ethers, ethylene-vinyl acetate copolymers, polyvinyl acetate, liquid crystal polymers, ethylene-tetrafluoroethylene copolymers, aromatic polyesters, polyvinyl fluoride, polyvinylidene fluoride, polyvinylidene chloride, tetrafluoroethylene, and mixtures, copolymers, reaction products, blends and composites comprising at least one of the foregoing polymers.

Claim 4. The composition according to claim 3, wherein said matrix polymer comprises polycarbonate and mixtures, copolymers, reaction products, blends and composites comprising polycarbonate.

Claim 5. The composition according to claim 1, wherein said fluoropolymer is selected from the group consisting of structural units derived from one or more fluorinated α -olefin monomers homopolymers, copolymers comprising structural units derived from two or more fluorinated α -olefin copolymers,

copolymers comprising structural units derived from one or more fluorinated monomers and one or more non-fluorinated monoethylenically unsaturated monomers and combinations thereof.

Claim 6. The composition according to claim 5, wherein said fluoropolymer is at least one selected from the group consisting of polytetrafluoroethylene, polyhexafluoropropylene, polyvinylidene fluoride, polychlorotrifluoroethylene, ethylene tetrafluoroethylene, fluorinated ethylene-propylene, polyvinyl fluoride, ethylene chlorotrifluoroethylene and combinations thereof.

Claim 7. The composition according to claim 1, wherein said encapsulating polymer is at least one selected from the group consisting of vinyl polymers, acrylic polymers, polyacrylonitrile, polystyrenes, polyolefins, polyesters, polyurethanes, polyamides, polysulfones, polyimides, polyetherimides, polyphenylene ethers, polyphenylene sulfides, polyether ketones, polyether ether ketones, ABS resins, polyethersulfones, poly(alkenylaromatic) polymers, polybutadiene, , polyacetals, polycarbonates, polyphenylene ethers, ethylene-vinyl acetate copolymers, polyvinyl acetate, liquid crystal polymers, ethylene-tetrafluoroethylene copolymer, aromatic polyesters, polyvinyl fluoride, polyvinylidene fluoride, polyvinylidene chloride, tetrafluoroethylene, mixtures, copolymers, reaction products, and composites comprising at least one of the foregoing polymers.

Claim 8. The composition according to claim 7, wherein said encapsulating polymer is at least one selected from the group comprising styrene-acrylonitrile and acrylonitrile-butadiene-styrene copolymers, alpha-alkyl-styrene-acrylonitrile copolymers, alpha-methylstyrene-acrylonitrile copolymers, styrene-butadiene rubbers, and combinations thereof.

Claim 9. The composition according to claim 1, wherein said fluoropolymer at least partially encapsulated by an encapsulating polymer is present in a range of between about 0.5 weight percent and about 60 weight percent based on the total weight percent of the resin composition.

Claim 10. The composition according to claim 1, wherein said fluoropolymer and the encapsulating polymer are present in a range between about 80 percent to about 20percent by weight of fluoropolymer and about 20percent to about 80 percent by weight of the encapsulating polymer.

Claim 11. The composition according to claim 1, wherein said fluoropolymer and the encapsulating polymer are present in a range between about 60 percent to about 40percent by weight of fluoropolymer and about 40percent to about 60 percent by weight of the encapsulating polymer.

Claim 12. The composition according to claim 1, wherein said filler is at least one selected from the group consisting of calcium carbonate, mica, kaolin, talc, glass fibers, carbon fibers, carbon nanotubes, magnesium carbonate, sulfates of barium, calcium sulfate, titanium, nano clay, carbon black, silica, hydroxides of aluminium or ammonium or magnesium, zirconia, nanoscale titania, and combinations thereof.

Claim 13. The composition according to claim 12, wherein said filler is at least one selected from the group consisting of mica, talc, silicon carbide and combinations thereof.

Claim 14. The composition according to claim 12, wherein said filler is present in a range of between about 0.5 weight percent and about 60 weight percent based on the total weight percent of the resin composition.

Claim 15. An article comprising the composition of claim 1.

Claim 16. A method of preparing a resin composition comprising
mixing a matrix polymer, a fluoropolymer at least partially encapsulated by a encapsulating polymer, and a filler to form a first mixture;

Claim 17. The method according to claim 16, including the steps of
melting said first mixture to form a molten mixture;
extruding said molten mixture in an extruder to form an extrudate; and

molding said extrudate.

Claim 18. The method according to claim 16, wherein said composition is processed to an improved tensile modulus and / or elongation at break relative to a composition comprising the matrix polymer with only said fluoropolymer at least partially encapsulated by an encapsulating polymer or filler.

Claim 19. The method according to claim 17, wherein said melting is carried out at a temperature of at least above the glass transition temperature of the matrix polymer.

Claim 20. The method according to claim 17, further comprising the step of stretching the molten mixture under shear.

Claim 21. An article made according to the method of claim 16, said method comprising the steps of:

mixing a matrix polymer, a fluoropolymer at least partially encapsulated by a encapsulating polymer, and a filler to form a first mixture;

melting said first mixture to form a molten mixture;

extruding said molten mixture in an extruder to form an extrudate; and

molding said extrudate to said articles.

Claim 22. An article comprising:

a matrix polymer consisting essentially of polycarbonate or polycarbonate blends;

a fluoropolymer at least partially encapsulated by a encapsulating polymer;

and a filler consisting essentially of mica or talc or silicon carbide.

Claim 23. The article according to claim 22, wherein said article has an improved tensile modulus and / or elongation at break relative to a composition comprising the

matrix polymer with only said fluoropolymer at least partially encapsulated by an encapsulating polymer or filler.